Haier

Service Manual

FILE No.**HMRSM-005-02**

Pharmacy Refrigerator

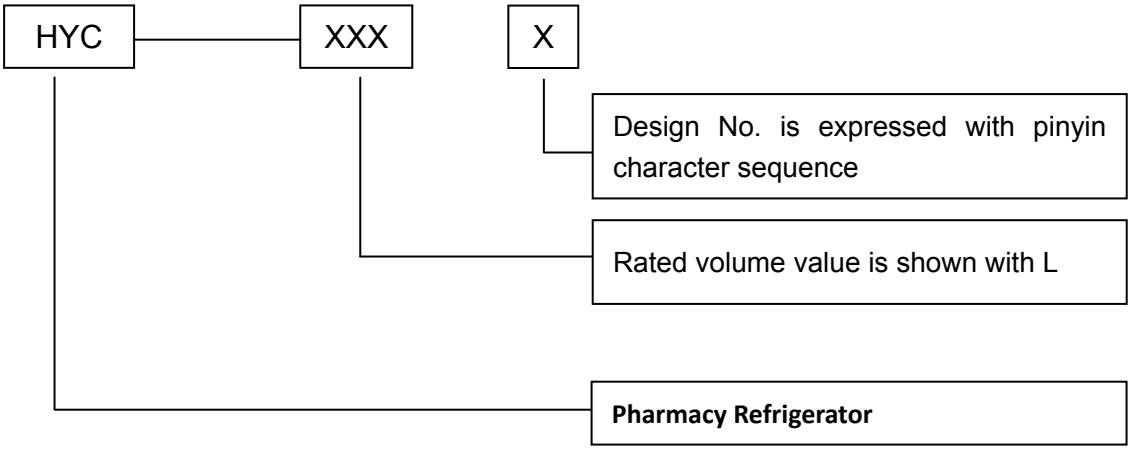
HYC-68•HYC-68A

HYC-118•HYC-118A

Content

Designation

Regulations for type naming:



Note: rated volume can be the gross volume or effective volume; the manufacturer can decide it by him according to the actual situation. The effective volume value must be marked on the nameplate whether effective volume or gross volume is marked in the product name.

HYC-68A is the replacement of the sight glass doors on the basis of HYC-68.

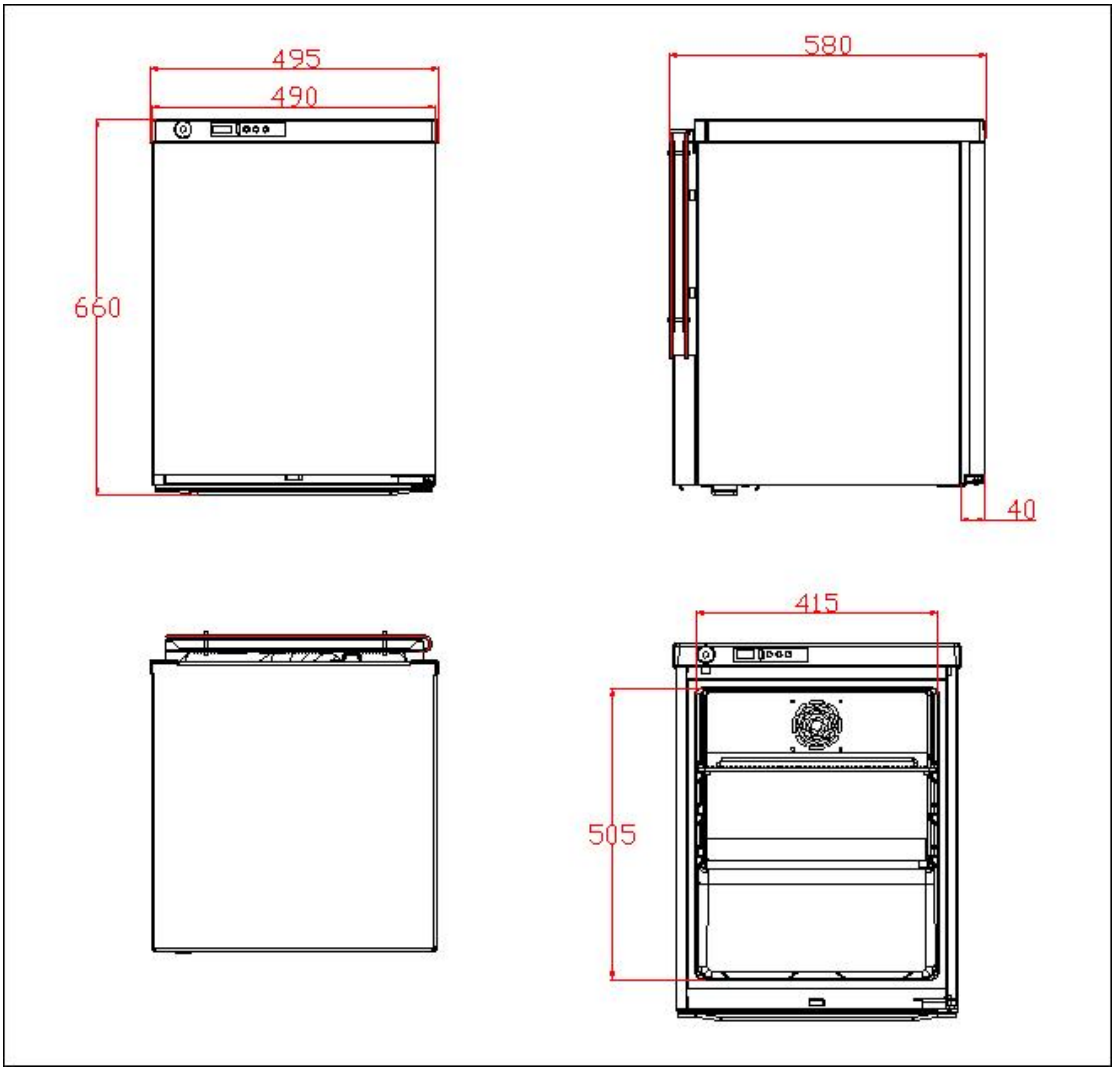
Introduction to Features of Product

1. Medical pharmaceutical refrigerator: Temperature can be between 2℃ and 8℃;
2. Micro-computer control and digital display for refrigerator temperature;
3. Automatic defrosting;
4. Visible acoustic-optical alarm for over-temperature alarm, door-opening alarm and sensor trouble alarm;
5. Air-cooled system with reliable operation;

Product appearance

Dimensions

HYC-68/68A

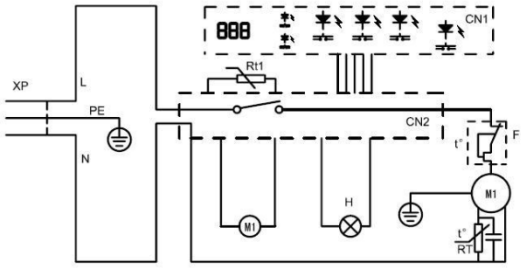


product nameplate

For example: HYC-68

Haier Pharmaceutical Refrigerator	
MODEL	HYC-68
Total Volume	68L
VOLTAGE	200-240V~/50Hz
CLIMATE CLASS	N
POWER INPUT	84W
RATED CURRENT	0. 65A
ANTI-SHOCK SAFETY CLASSIFICATION	I
REFRIGERANT	R134a 71g
FOAMING AGENT	CP
NET WEIGHT	38Kg
SERIAL NO.	

CIRCUIT DIAGRAM



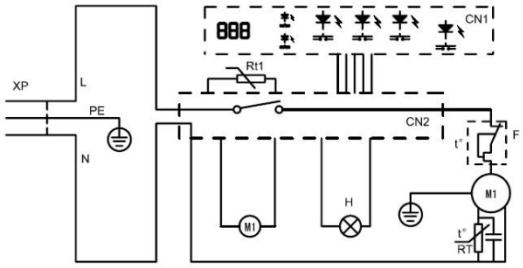
XP-Power Plug CN1-Display Panel CN2-Main Control Panel
Rt1-Temperature Sensor H-Lamp F-Motor Protector
M1-Fan M-Compressor RT-Starting Relay

Haier Medical and Labolatory Products Co.,Ltd
Haier Industrial Park, Economic Technology Development
Zone Qingdao 266510.P.R.China

For example: HYC-68A

Haier Pharmaceutical Refrigerator	
MODEL	HYC-68A
Total Volume	68L
VOLTAGE	200-240V~/50Hz
CLIMATE CLASS	N
POWER INPUT	84W
RATED CURRENT	0. 65A
ANTI-SHOCK SAFETY CLASSIFICATION	I
REFRIGERANT	R600a 22g
FOAMING AGENT	CP
NET WEIGHT	38Kg
SERIAL NO.	

CIRCUIT DIAGRAM



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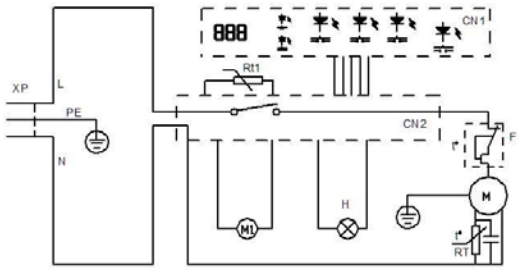
For example: HYC-118

Haier Pharmaceutical Refrigerator	
MODEL	HYC-118
Total Volume	118L
VOLTAGE	220-240V~/50Hz
CLIMATE CLASS	N
POWER INPUT	160W
RATED CURRENT	1.02A
ANTI-SHOCK SAFETY CLASSIFICATION	I
REFRIGERANT	R134a 90g
FOAMING AGENT	CP
NET WEIGHT	41Kg
SERIAL NO.	

CIRCUIT DIAGRAM



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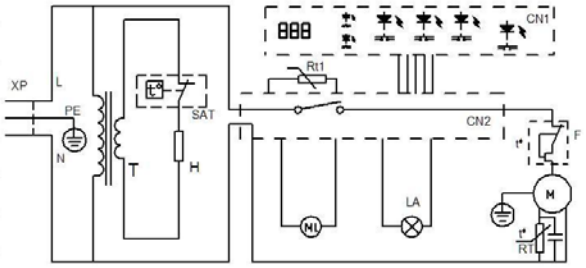
Rt1-Temperature Sensor H-Lamp F-Motor Protector
M1-Fan M-Compressor RT-Starting Relay

Haier Medical and Laboratory Products Co.,Ltd
Haier Industrial Park, Economic Technology Development Zone
Qingdao 266510.P.R.China

For example: HYC-118A

Haier Pharmaceutical Refrigerator	
MODEL	HYC-118A
Total Volume	118L
VOLTAGE	220-240V~/50Hz
CLIMATE CLASS	N
POWER INPUT	160W
RATED CURRENT	1.02A
ANTI-SHOCK SAFETY CLASSIFICATION	I
REFRIGERANT	R134a 85g
FOAMING AGENT	CP
NET WEIGHT	46Kg
SERIAL NO.	

CIRCUIT DIAGRAM



XP-Power Plug CN1-Display Panel CN2-Main Control Panel
Rt1-Temperature Sensor LA-Lamp F-Motor Protector
M1-Fan M-Compressor RT-Starting Relay
SAT-Mechanical Controller T-Transformer H- Heater

Haier Medical and Laboratory Products Co.,Ltd
Haier Industrial Park, Economic Technology Development Zone
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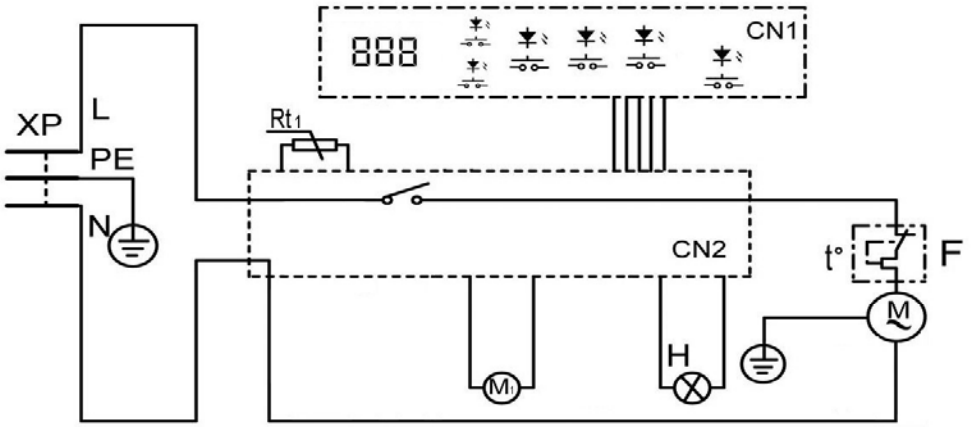
Technical Data

Model	HYC-68/68A	HYC-118/118A
Weather type	N	N
Protection type against electric shock	I	I
Effective volume (L)	68	118
Rated voltage	220V/50Hz	220V/50Hz
Fan power (W)	1.3	1.3
Total input power(W)	84	160
Power consumption (kW·h/24h)	0.57/0.93	1.1
Refrigerant R134a(g)	R134A 71g/R600a 22g	R134A 90g/85g
Outline dimension (w*d*h)(mm)	500*490*640	597×645×835
Net weight(kg)	38	41/46
Compressor	HVY57AA	TL5G

Circuit Diagram

HYC-68/68A/118



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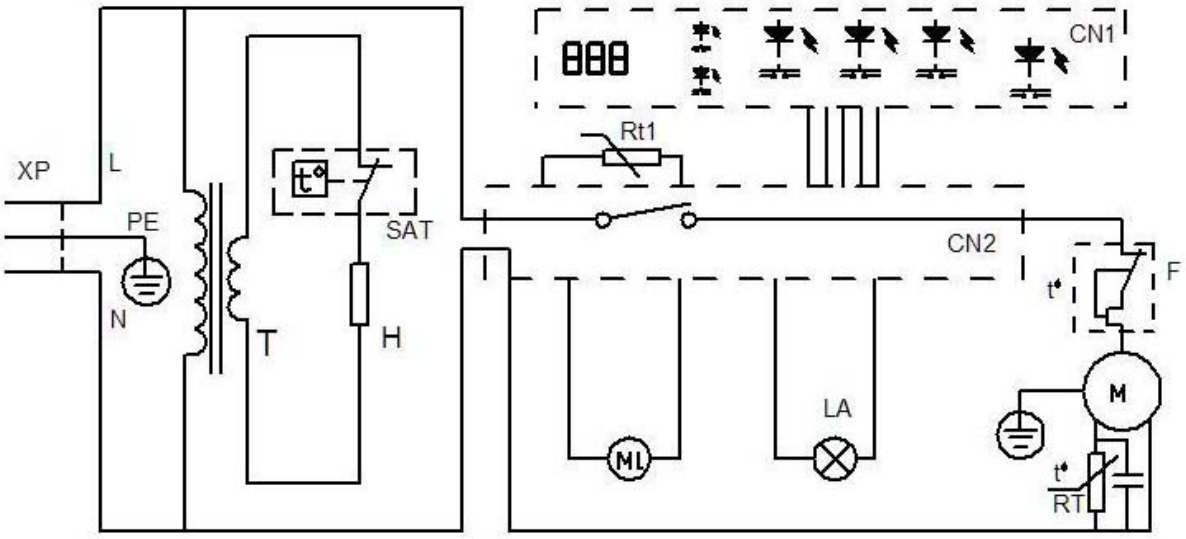
Rt1-Temperature Sensor H-Lamp F-Motor Protector
M1-Fan M-Compressor

HYC-118A



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Compressor Parameters

(Under Standard Operating Conditions)

Product model	HYC-68/68A	HYC-118/118A
Compressor model	Zanussi HVY57AA	TL5G
Refrigeration capacity (W)	95	
Input power(W)	68.4	
Rated voltage(V)	220-240	220-240
Rated frequency(Hz)	50	50
Current(A)	0.38	
Cooling mode	Natural cooling	Natural cooling
Oil infill (cc)	200 (mineral oil)	

Fan motor Parameters

(Under Standard Operating Conditions)

Fan model：	AD0912LB-A71GL
Voltage(V)：	DC 12
Rotate speed(rpm)：	2300
线路描述：	红色线为正极，黑色线为负极
Current(A)：	0.13
叶片材质：	黑色 ABS 工程塑料

Computer Board

1. The computer board consists of display board and main control board for close cooperation.

2. Basic parameters (for power):AC current

2.1. Rated voltage: 220~240V

2.2. Rated frequency: 50Hz as universal frequency

2.3. Rated power: 350W

2.4. Automatic voltage identification: With

2.5. Automatic frequency identification: With

2.6. The maximum operating load of controller: 500W

3. Safety certification requirements: CE certification, 3C certification

4. Environmental protection: To meet ROHS requirements.

5. Load requirements (for compressor):

   Rated voltage: 220~240V

   Rated frequency: 50Hz

   Rated power: 350W

   Rated rotation speed: Constant frequency

   Load type: Inductive load

   Operation characteristics: Perennial work with frequent startup

   With/without speed control: Without control

   With/without motor trouble protection: Twice bootstrap period can not be less than 5 minutes.

6. The computer board has antiriot functions.

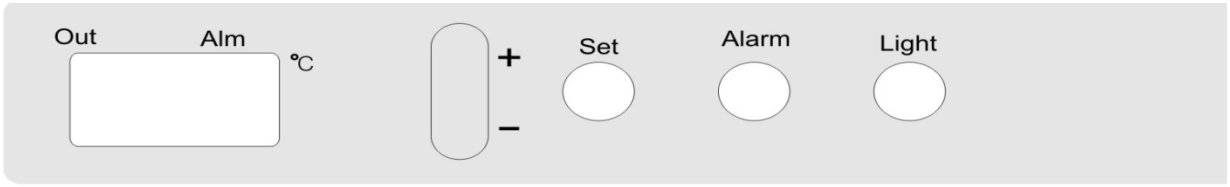
7. Interference resistance requirements:

The computer board has interference resistance functions. Electromagnetic wave transmitted by common electronic appliances such as mobile phone and play station, etc cannot influence normal operation of computer board.

Operation panel

1. Appearance:

(Display panel and display board are shown in following figure.)



2. Key

2.1 Temperature up/down key: To press up/down key for temperature setting.

2.2 Setting key: To set functions and enquire the maximum and minimum refrigerator temperature.

2.3 Lighting switch key: To press lighting key so that lighting lamp is on. To press it again so that it is off.

2.4 Alarm key: To set alarm limit, inquiry of upper and lower alarm limits and trouble cancellation functions;

Peripheral Signal of Computer Board

1. System input quantity:

A、Temperature sensor: With ordinary refrigeration sensor in the refrigerator;

B、Key signal: Please refer to key definition for details.

C、Door switch signal: With door switch signal;

Fan is connected when door body is closed and it is disconnected when door body is opened. Door switch is fitted with normally closed switch. That is, 2 terminals of switch are closed when opening the door body.

D、Over-zero detection signal:The same to ordinary one;

2. System output control quantity:

A、Press control: Constant frequency compressor is controlled by temperature.

B、Control of lighting lamp: There is 1 group of LED lighting lamps. There are 3 emitting diodes of DC 12V and 120mA for every group. Lighting lamps are controlled by lighting lamp switch.

C、Fan in the refrigerator: There is a DC 12V fan of 1.3W in the refrigerator. It is controlled by door switch.

D、Display control: With display control

E、Buzzer control: With buzzer

Function Control

Display and Key Control

1. Display:

1.1 Refrigerator shall display actual temperature during initial power supply and after temperature reduces to the minimum value and before increasing to setting temperature which corresponds to such temperature gear.

1.2 Current actual temperature is ±2°C of setting temperature for gradual variation to setting temperature. Display temperature will change to actual temperature gradually without temperature variation jumping under normal conditions if current temperature exceeds setting temperature by 2°C. Variation is ±1°C /min during all temperature variations;

1.3 Please conform with Clause 3 during setting alternation;

1.4 Displayable scope of display board refrigerator is 50℃ to -45℃. Adjustable scope is 20℃ to -40℃.

1.5 Please conform to Clause 4 for over-temperature alarm and sensor trouble alarm.

2. Color definition of indicator lamp:

(As shown in display effect diagram), display is a 3-bit digital display with 2 indicator lamps above it. It is alarm indicator lamp(ALARM) and it is on during alarm. The other is output indicator lamp and it is on during press bootstrap.

The lamp flickers when temperature reaches bootstrap point but press has not been started up due to delay. Please check if alarm or output indicator lamp is on or not according to actual conditions during power supply of display board.

3. Initial status:

Operation status for initial power supply is initial status.

Operating temperature of refrigerator: Default setting temperature is 4℃ and lamp in it is closed. Display control board will display default setting temperature and flickers by frequency of 1Hz. It will display actual temperature of refrigerator automatically after 5 seconds. Press will not be started up if refrigerator temperature is between bootstrap point and shutdown point during initial power supply. It can not be started up until temperature reaches

bootstrap point.

There is no alarm if refrigerator temperature is within scope of alarm limit. There is instant temperature alarm and buzzer will ring if refrigerator temperature is out of control limit scope. Alarm lamp will flicker and alarm sound can be cancelled by pressing alarm key. However, alarm indicator lamp will keep flickering and it is off only when refrigerator temperature is within scope of alarm limit.

4. Temperature control

4.1 Temperature control

Bootstrap temperature = Setting temperature + Control temperature difference, rd

Shutdown temperature = Setting temperature – Control temperature difference, rd

“Output” lamp is on during press bootstrap and it is off during shutdown.

4.2 Press shall stop operation for 5 minutes forcefully if refrigerator temperature fails to reach setting temperature if press operates for 4 hours continuously. Press can not be started up until 5 minutes after shutdown.

4.3 Hot Gas Defrosting

To stop forced defrosting if accumulated compressor bootstrap period reaches **d2** hours if setting temperature exceeds 0℃. Fan in refrigerator normally operates during defrosting and press will stop operation. Please start up it again after meeting one of 2 conditions shown as follows:

Testing temperature of refrigerator Setting temperature+4℃

Defrosting period≥15 minutes;

Press will start up instantly after defrosting ends.

There is no defrosting demand if setting temperature is less than 0℃.

4.4 Setting Method of Refrigerator Temperature

Setting refrigerator temperature shall be adjusted according to following method:

To press SET key then loosen it quickly so that display window can display original design value with flickering. To press “+” or “-” to adjust setting value if it flickers.

Setting value can vary by 1℃ by pressing it every time. It will exit automatically

and display refrigerator temperature again (without flickering) if there is no operation within 10 seconds.

4.5 Setting of Internal Parameters

Several internal parameters can be adjusted by following method to guarantee normal operation of refrigerator:

To press “regulate” key for more than 10 seconds to display original design value (rd) with flickering; To press “+” or “-” to adjust setting value. Adjustment scope is 1℃ to 4℃ because setting value can vary by 1℃ by pressing the key every time. To press “alarm” key to exit and return to previous layer for rd display. (To press “alarm” key to return to previous layer by pressing the key once until return to refrigerator temperature display). To select next parameter by pressing “+” or “-”. Internal parameters are shown in the 1st attached form. Regulation method is as above.

Form 1:Internal parameter form under control contents

No.	Internal parameter	Parameter instructions	Scope	Default value	Instructions /unit
1	**rd**	Adjustment gain is 1 for setting temperature difference	**1~6**	**2**	℃
2	**r1**	Adjustment gain is 1 for the maximum setting temperature	**LE~20**	**8**	℃
3	**r2**	Adjustment gain is 1 for the minimum setting temperature	**-40~HE**	**0**	℃
4	**c1**	Press delay startup period during controller operation	**0~10**	**0**	**min**
5	**c2**	The minimum compressor shutdown period	**0~10**	**5**	**min**
6	**c3**	Long-term operation period of fast chilled compressor	**1~50**	**24**	**hour**
7	**do**	Adjustment gain is 1 when controlling operation period under trouble	**5~15**	**10**	**min**
8	**dF**	Adjustment gain is 1 when controlling shutdown period under trouble	**5~15**	**10**	**min**
9	**d1**	Defrosting type (1—hot gas defrosting; 2—electric defrosting)	**1-2**	**1**	**--**
10	**d2**	Detailed defrosting interval	**4-16**	**8**	**Hour**
11	**AD**	Delay period of temperature alarm	**0~20**	**15**	**min**
12	**CA**	Correction of display temperature	**-5~+5**	**0**	℃

4.6 Inquiry of the Maximum and Minimum Refrigerator Temperature

The maximum and minimum refrigerator temperature can be enquired by following way:

The maximum or minimum temperature is actual temperature detected by sensor, not the maximum or minimum displayed temperature.

Enquiry of the maximum value:

In the meanwhile, users can press “SET” key and “+” to display the maximum actual value without flickering in the window. Please loosen any key to return to display refrigerator temperature.

Enquiry of the minimum value:

In the meanwhile, users can press “SET” key and “-” to display the minimum actual value without flickering in the window. Please loosen any key to return to display refrigerator temperature.

Record mode of the maximum and minimum temperature: To press SET key to cancel previous temperature record and begin to record the maximum and minimum temperature again.

5. Alarm Control

5.1 Refrigerator will carry out over-temperature alarm and buzzer will ring during operation if refrigerator temperature is less than or equal to the minimum temperature limit or more than or equal to the maximum temperature limit without return to alarm limit temperature scope within 15 minutes. Alarm indicator flickers and users can cancel alarm sound by pressing alarm key. However, alarm indicator lamp will keep flickering and it is off only when refrigerator temperature is within alarm limit scope.

5.2 It shall alarm instantly and buzzer will ring if there is any sensor trouble. Alarm lamp will flicker and window will display “EE” at the same time. Alarm sound can be canceled by pressing alarm key but alarm indicator lamp and “EE” display will continue. In the meanwhile, it can enter into safety mode for compressor operation control according to internal parameters dO and dF.

5.3 Door switch alarm

Buzzer will ring and alarm indicator will flicker if refrigerator door is opened for more than 1 minute. Users can cancel alarm sound by pressing alarm key but alarm indicator lamp will keep flickering until door is closed.

5.4 Enquiry of alarm limit

High alarm limit can be enquired by following way: To press alarm key and “+”

key at the same time to show higher alarm limit in the window without flickering. It can return to refrigerator temperature display when loosening the key.

Enquiry of lower alarm limit: To press alarm key and “-” key at the same time to show lower alarm limit in the window without flickering. It can return to refrigerator temperature display when loosening the key.

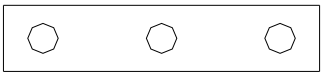
5.5 Setting of high/low-temperature alarm limit

High-temperature alarm limit (HA) and low-temperature alarm limit (LA) can be set by following way:

Please press “alarm” key for more than 10 seconds to show code HA in display window. Then press “set” key once again to show original setting HA with flickering. Please adjust setting value by pressing “+” or “-” key. Setting value can vary for 1℃ by pressing it every time. Adjustment scope is at most 6℃ higher than setting refrigerator temperature. Please press “alarm” key for exit and return to previous layer for rd display. (To press “alarm” key to return to previous layer by pressing the key once until return to refrigerator temperature display). The other parameter LA can be selected by pressing “+” or “-” key. LA setting method is as above. Adjustment scope is less than setting refrigerator temperature by at most 6℃.

6. Control of Lighting Lamp

6.1 As emitting diode, lighting lamp can be used with computer board together. Emitting diode is welded to lamp board (with dimension of 11*52). (As shown in attached diagram,) there are 6 lamp boards totally.



6.2 Control of Lighting Lamp

On/off of internal lamp can be controlled by pressing “lamp” control key.

7. Fan Control

Fan stops operation when opening the door and it will delay for 1 minute when closing the door.

8. Power Failure Memory Function

With power failure memory function, temperature setting can return to original setting status after power re-supply.

9. Delay Protection Function

Shutdown and bootstrap interval of compressor shall be not less than **c2** minutes.

Trouble Display and Treatment

Display temperature is “EE” for display board and it will flicker by frequency of 1Hz during trouble (such as short circuit or broken circuit) of temperature sensor. In the meanwhile, it will buzz and enter into protection mode for compressor operation control according to internal parameters dO and dF.

Display priority of display board: Trouble status display>Setting status display>Normal display

Details of Main Replacement Parts

HYC-68/68A

Product model	No.	Parts details	Specification or model	Special No.
HYC-68/68A	1	Compressor	Zanussi HYVY57AA	0074090641
	2	Display board		0071800028
	3	Panel film	PET	0070507038
	4	Lamp switch gear		0070106133
	6	Power wire		0070400320
	7	HYC-68 combination wire		0070402225
	8	General assembly of control board		0071800027
	9	JC-126GS lamp cover PS		0070203698
	10	Lamp	12V	0074091200
	11	fan	DC 12V	0074091127
	12	Composite board evaporator		007-0060702435
	13	Filament condenser		0070701888
	14	Shelf		0070106771
	15	Shelf bar		0070106772
	18	Foaming door(HYC-68)		0070815214
	19	Glass door(HYC-68A)		0070813323

HYC-118/118A

Product model	No.	Parts details	Specification or model	Special No.
HYC-68/68A	1	Compressor	Zanussi HYVY57AA	0074090641
	2	Display board		0071800028
	3	Panel film	PET	0070507038
	4	Lamp switch gear		0070106133
	6	Power wire		0070400320
	7	HYC-68 combination wire		0070402225
	8	General assembly of control board		0071800027
	9	JC-126GS lamp cover PS		0070203698
	10	Lamp	12V	0074091200
	11	fan	DC 12V	0074091127
	12	Composite board evaporator		007-0060702435
	13	Filament condenser		0070701888
	14	Shelf		0070106771
	15	Shelf bar		0070106772
	18	Foaming door(HYC-68)		0070815214
	19	Glass door(HYC-68A)		0070813323

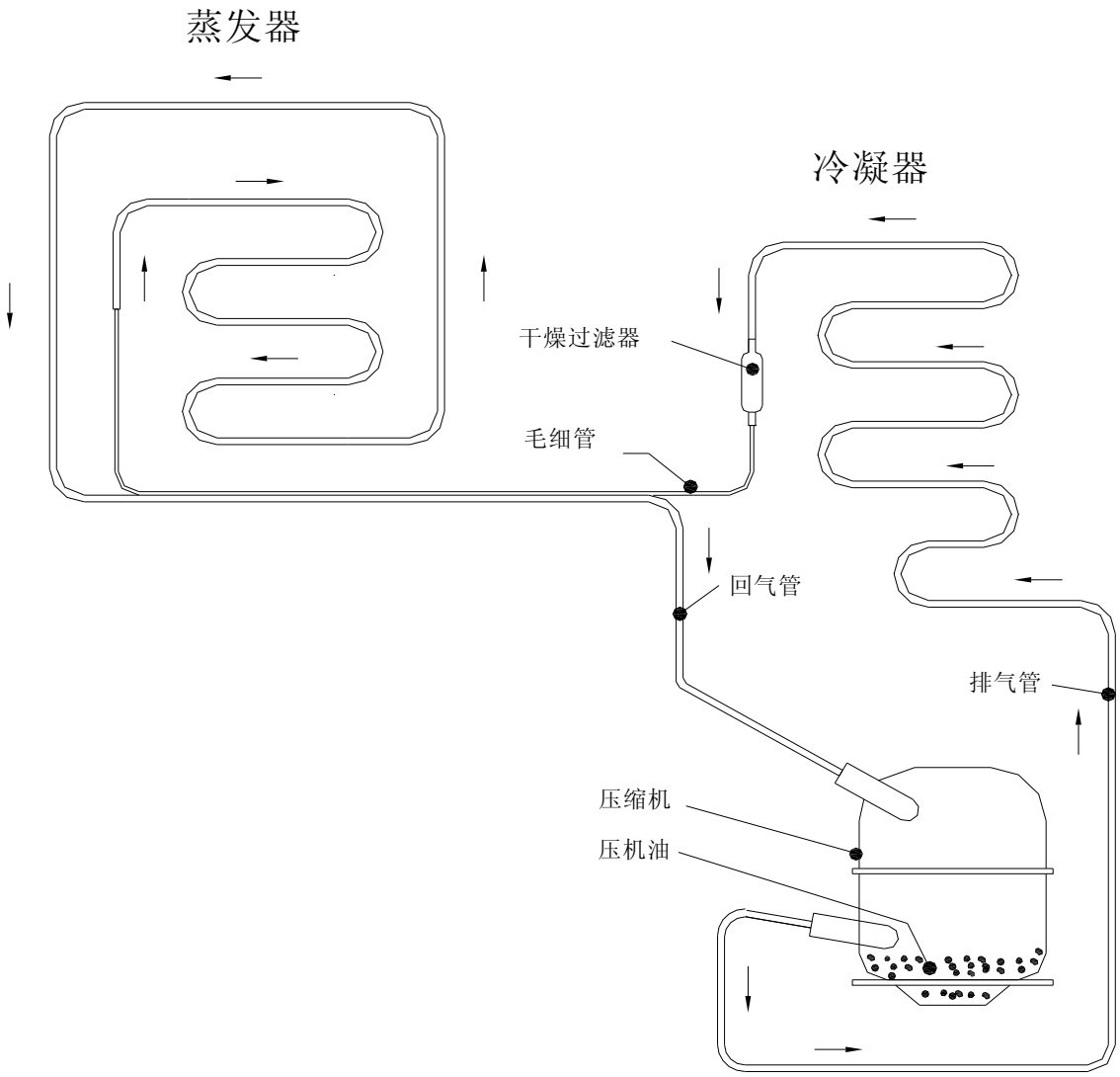
Common Trouble Analysis and Repair Measures

Problem	Reason analysis	Repair measures
1. No startup of press	1. Broken fuse	To replace fuse
	2. Damaged connectors for cabin wiring	To replace connectors
	3. Poor wiring of electric control box	To install and position after inspection
	4. Trouble of control board	To replace control board
	5. Broken starter or thermal protector	To replace starter or thermal protector
	6. Press trouble	To replace press
2. Uneven refrigerator temperature and large temperature difference	1. Trouble of internal fan	To replace fan
	2. Air ducts are jammed by obstacles	To remove obstacles
	3. Broken door switch	To replace door switch
	4. Trouble of power board	To replace power boards
3. Display board can display “EE”	To replace sensor combination wire(of 0070402225) if there is any trouble.	
4. Large noise of refrigerator	1. Rough placement position	To alter position of refrigerator
	2. Resonance between pipelines or product boxes during press operation	To set pipeline to avoid resonance
	3. Loose fixation of internal and external fans and fan supports	To fix it gain
5. Poor refrigeration of refrigerator	1. Severe refrigerant leakage	To detect leakage and re-fill refrigerant
	2. Dirty and jammed capillary or system	To clean capillary or replace filter
6. Without alarm	1. Poor wiring	To inspect, install and position
	2. Trouble of control board	To replace control board

Reply of Common Problems

Problem	Answer	Treatment measures
1. Higher or lower refrigerator temperature	It relates to ambient temperature. Higher or lower refrigerator temperature can be solved by adjusting control temperature.	Please refer to Appendix 1 for detailed operation method.
2. Water accumulation in the refrigerator after a certain operation period	To clean it by towel periodically if there is a little of water. To check if gutters are jammed or hindered or not then dredged by thin iron wires if there are a lot of water.	
3. No rotation of internal fan	To inspect lamp switch below refrigerator to check if it coincides with that below door body or not.	

Structural Principle Sketch of Refrigeration System



蒸发器	evaporator
冷凝器	condenser
干燥过滤器	dry filter
毛细管	capillary
回气管	air return tube
压缩机	compressor
压机油	press oil
排气管	air exhaust tube

Important components to install and remove

1. Demolition, installation considerations

Be confirm that unplug the power when Demolition and installation;
When installed in accordance with the demolition of the assembly sequence contrary, when any part of the product must be installed in the same place the assembly in place.

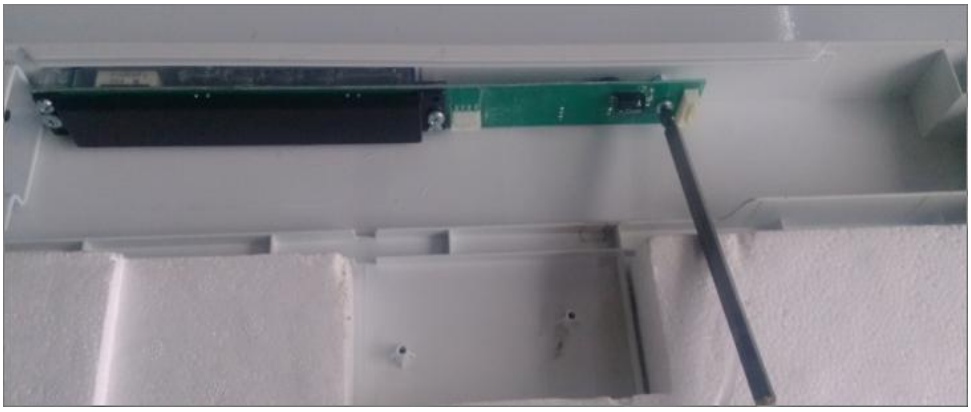
2. Disassembly and installation guide

2.1 control panel

※Step1： Remove the cover plate back two screws；

※Step2： open the top cover, and then disconnect the display panel wire-line；

※Step3： remove 3 screws on the display panel,so that can separate the top cover.

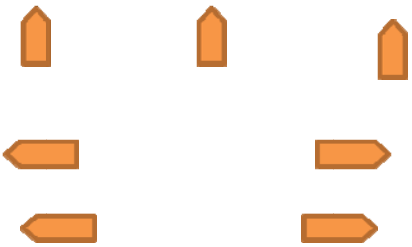


※Step4： open the cover so that can replace the display board.

※Notes： When install the Cover , be sure to align the plate gap and metal part on the main body, refer to the below:

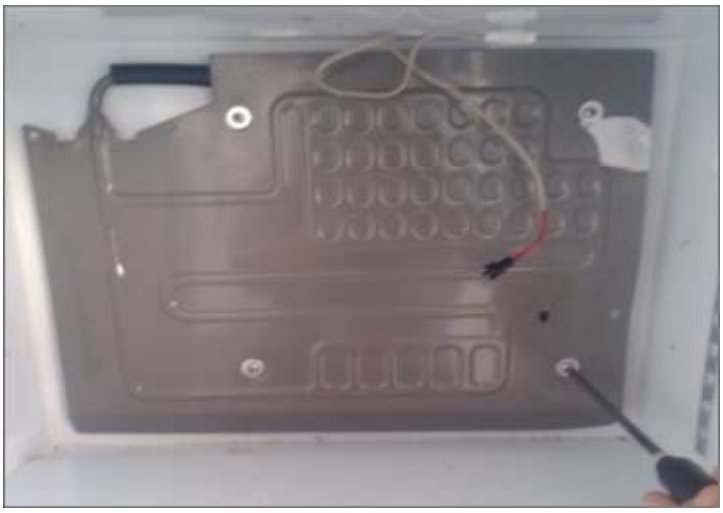
2.2 installation and removal of the fan

※Step1： open the door and remove all the screws；



※Step2： Disconnect the fan wire-line, so that the fan can be replaced；

※Step3： remove these 4 screws, so that the evaporimeter can be moved



Note: Be careful about the ecaporimeter and remove it slowly.

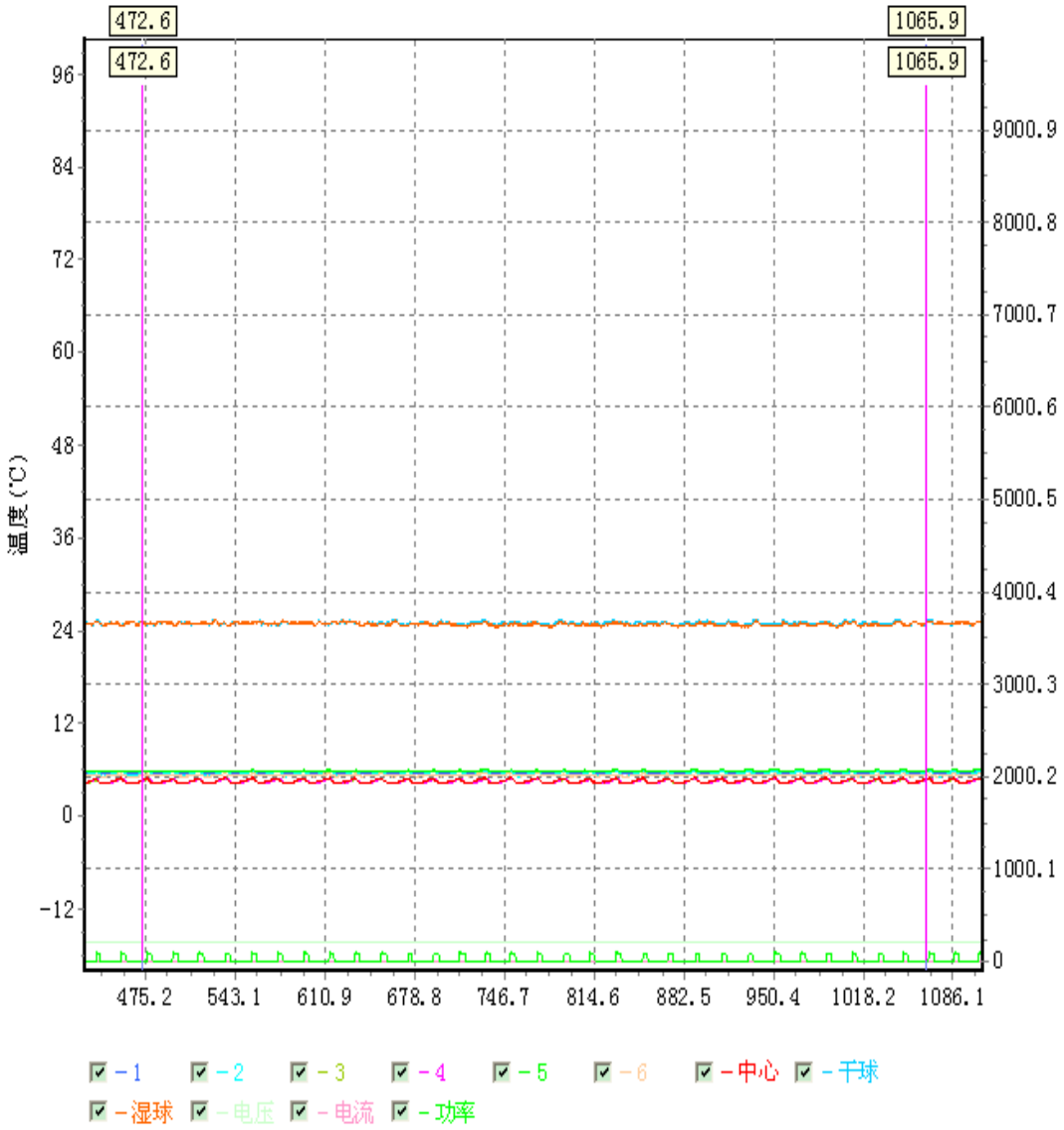
2.3 installation and removal of the compressor

Step1.remove these 4 screws in the back

Step2.remove these 2 screws。

Step3. Removed the four hexagonal bolts connected to the main body, so that the compressor can be complete removal.

Testing Date



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